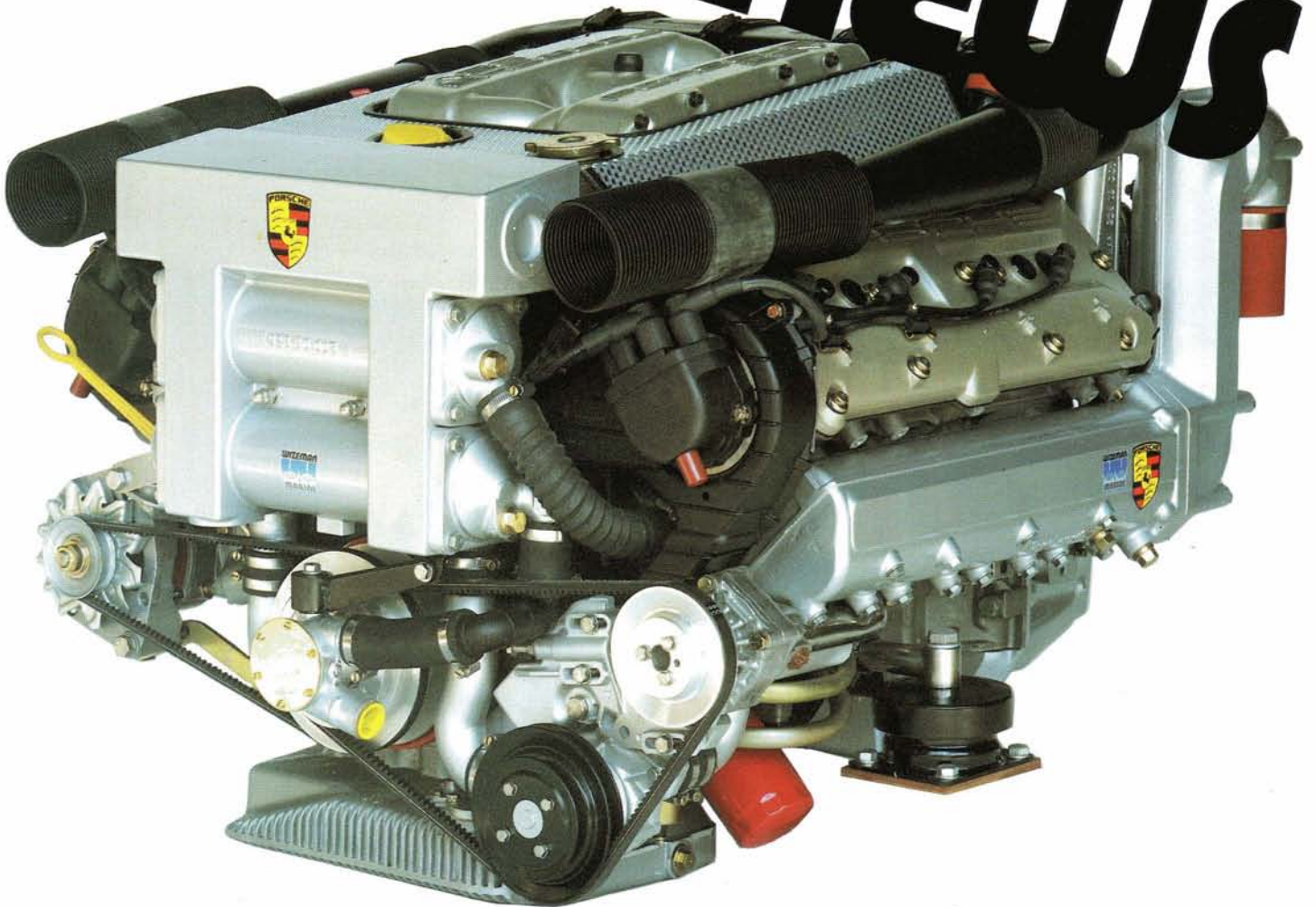


WIZEMAN

SEPTEMBER 86



NEWS



WP 928 S/4

WIZEMAN Marine
boatomotive contractor to

Dr. Ing. h. c. Ferdinand PORSCHE Aktiengesellschaft presents:

"THE POWERFUL HEART OF YOUR BOAT"

WP 928 S/4

Today's 928 S 4 engine is designed with highly innovative engineering to produce an unparalleled combination of power, smoothness, long-term reliability and fuel economy.

With a displacement of 5 Liters (303 cu in.) and a compression ratio of 10,0:1 the liquid-cooled engine of the PORSCHE 928 S 4 yields 300 net SAE HP at 5800 RPM in marine version.

Maximum torque of 309 foot pounds is developed at 3000 RPM. The engine operates on premium unleaded gasoline of 91 octane or higher. The four-valve head design includes two intake and two exhaust valves per cylinder developing optimized "breathing" in conjunction with the double-resonance-charging system.

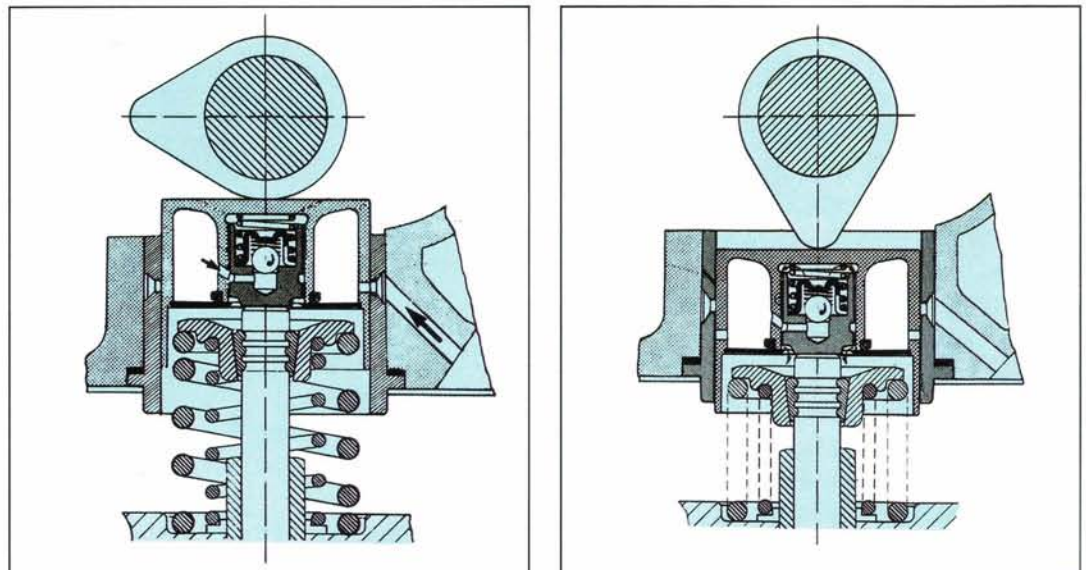
WP 928 S/4



A virtually maintenance-free valve train

The four-valve per cylinder design of the 928 S 4 engine operates with dual overhead camshafts and has a specially developed tooth profile (which engages far more quietly than conventional profiles) and a hydraulic damped belt-tensioner. Proper lubrication at every lubrication point, even during high-speed cornering, is ensured by a force-fed lubrication system with a special high-pressure oil pump, with oil channels cast directly into the engine block. Camshafts open and close the valves via self-adjusting hydraulic cup tappets.

The valves are continually reset automatically, up to 3000 times each minute, by a return spring working in conjunction with a calculated amount of leakage oil during each valve movement. This automatic adjustment is performed regardless of whether the engine is cold or warm, to a tolerance of 0,05 mm. Wear to the valves and valve seats is therefore minimized, making the engine practically maintenance-free, only requiring scheduled servicing every 500 hours of operation.



Impressive performance characteristics

PORSCHE engineers developed the 928 S 4 engine to offer impressive acceleration throughout the RPM range. As a result, the 928 S 4 car accelerates from 0 to 60 mph in just 5.8 sec. and has a top track speed of 167 mph, thus an adequate speed with boats can be expected. Such responsive performance is not RPM-limited. The tremendous torque developed by this power plant is sufficient to permit economical operation at cruising speed and yet retaining sufficient reserves for fast-coming out when waterskiing.

A silky-smooth eight cylinder engine

For the 928 S 4, PORSCHE Engineering mounted an intensive noise and vibration isolation campaign. The extremely quiet operation of today's 928 S 4 engine bears eloquent testimony to the success of this effort. It begins with connecting rods individually balanced to precise weight tolerances, combined with a crankshaft carrying six counterweights, and supported by five main bearings. This "over-engineering" ensures the ideal equilibrium necessary for low-vibration operation. To reduce noise conduction into the interior of the 928 S 4, the engine is mounted on specially developed adjustable elastic mounts. Vibration and severe shocks are absorbed by this system and thus far less vibration is transmitted to the hull.

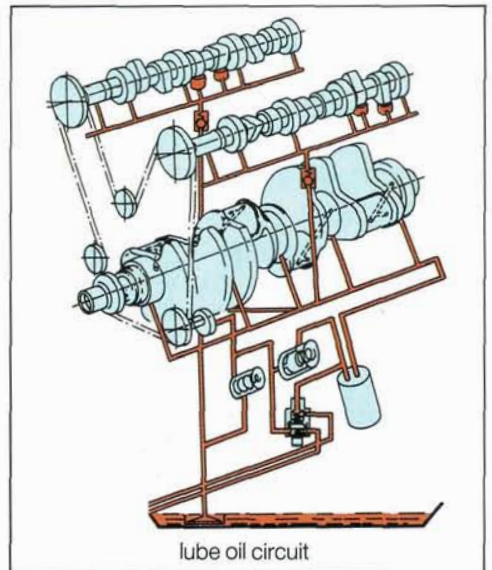
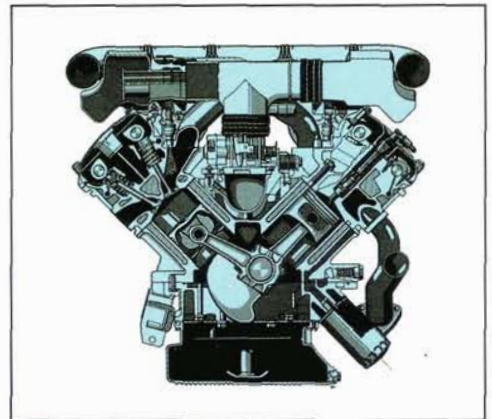
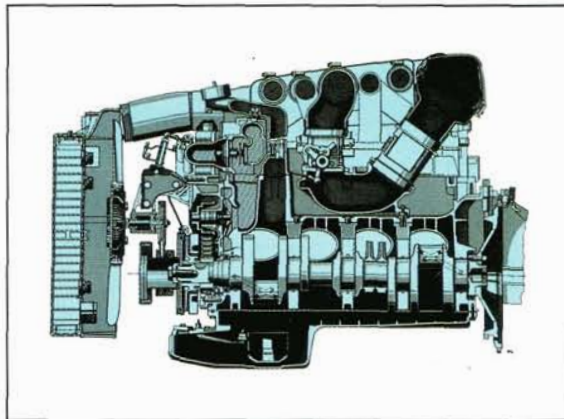
WP 928 S/4



Aggressive technology for the 928 S/4

Engine technology by PORSCHE

Design and construction goals set for the 928 S 4 engine represented an exciting developmental challenge for PORSCHE. Here was an opportunity to solve the problems inherent in light-weight aluminium pistons running in cast iron cylinders. Since the coefficient of expansion of aluminium is twice that of cast iron when heated, the clearance between piston and cylinder diminishes as heat builds up, and with some designs may even cause the piston to seize in the cylinder. The wide clearance normally used to avoid such seizing can produce drawbacks such as piston knock or tilt and combustion "blow-by" around the piston, wasting fuel and oil. For the 928 S 4, PORSCHE engineers opted for a novel solution: fabricating both cylinders and engine block from aluminium alloys selected for their identical thermal expansion rates. A new casting process was created to produce an engine block of alloy mixed with 17 % silicon. When the cast part hardens, extremely fine



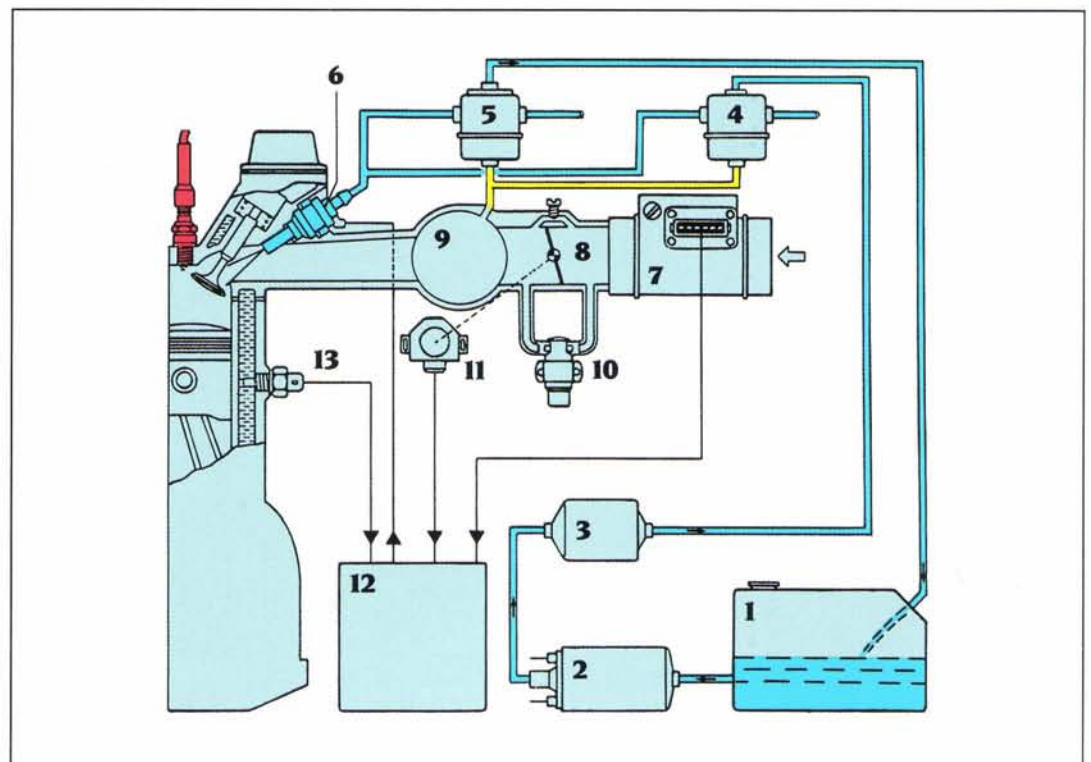
crystals form having a hardness approximately comparable to industrial diamonds. The 928 S 4 alloy piston slides on this extremely hard surface with very low wear. This lack of friction, combined with the minimal distance between the piston and cylinder, allows this engine to use fuel far more efficiently than with conventional technologies: to run more economically, be more pollution-free, quieter while still enjoying exceptional reliability and durability.

WP 928 S/4



The new "jetronic" generation in the EZF ignition system

For over 10 years, PORSCHE has been the only important automobile manufacturer in the world to offer all engines equipped with fuel injection. The PORSCHE 928 S 4 employs a new-generation fuel injection-system – the LH-Jetronic – for precise fuel/air mixture and constant fuel metering. This system employs the principle of air density measuring via a microcomputer-assisted electronic control system, and employs the most modern digital technology available.



- 1 Fuel tank
- 2 Fuel pump
- 3 Fuel filter
- 4 Pressure damper
- 5 Pressure regulator
- 6 Injector(s)
- 7 LH air mass meter
- 8 Throttle housing
- 9 Air-intake chamber
- 10 Additional air slide valve
- 11 Throttle switch
- 12 LH-control unit
- 13 Temperature sensor II

- Fuel supply** 
- Vacuum control** 
- Spark plug** 

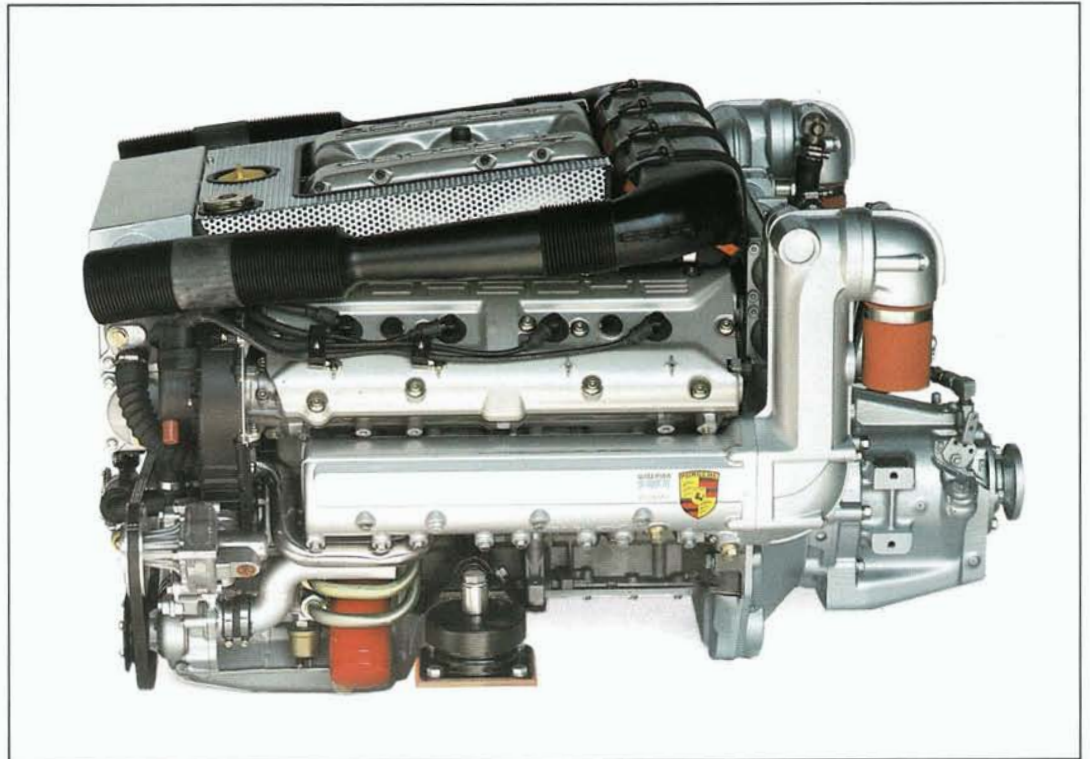
PORSCHE selected the Electronic Ignition Characteristic (EZF) ignition system for the 928 S 4 because it offers several advantages compared to conventional transistor ignition systems. Aside from an occasional change of spark plugs, this state of the art ignition system is virtually maintenance-free, has no breaker contacts to burnout and no disruptive capacitor. The LH-Jetronic and EZF ignition system are applied synergistically in the PORSCHE 928 S 4 to provide an optimum combination of performance and economy. Its exact spark advance control makes the engine extremely economical during warmup. A finely tuned air fuel mixture is responsible for minimizing fuel consumption even during full load operation. When major electrical accessories are turned on, the idling speed is automatically increased slightly and stabilized by an idle regulator.

WP 928 S/4



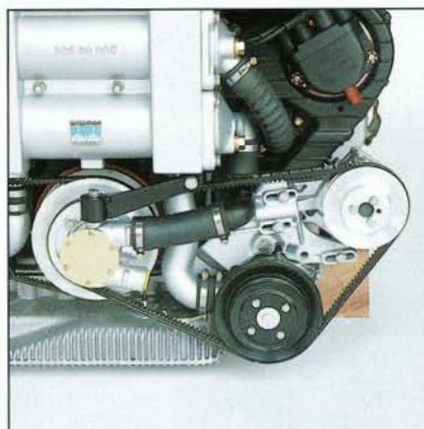
Very Sound Reasons

A perfect synthesis of apparently contradictory factors. Sports car engines need to be small in size and light in weight. Fuel economy has already been engineered into the basic engine coupled with the legendary long-life PORSCHE concept.



Experience in Building Marine Engines

The perfect synthesis of apparently contradictory factors is no accident; it arises out of extensive knowledge gained in research and development in virtually all functions of engines and their construction. For over 50 years WIZEMAN has been producing essential components and for 25 years has been engaged in engine marinisation.



WP 928 S/4



Cooling System

Salt water is aggressive. Consequently components exposed to this hostile environment are made in metals with a high specific weight and with generous wall dimensions. A new triple circulation cooling system has been developed which embraces a closed circuit for the basic engine, another closed circuit for the cooled manifolds and intermediate manifold as well as the heat exchanger for engine oil and, if required, gear oil.



A third, open circuit, driven by a seawater pump, supplies sufficient raw water to cool the closed circuits over bundles of tubes in exchangers and hence through the exhaust system overboard. Insofar as the closed system components are not subject to the corrosive action of salt water they could be manufactured in special light metal materials.

These components have been treated with an elastic-powder coating on the outside to give long-term resistance to spray and sea air.

Salt Water and Electronic Components

All cables and sockets are fitted with additional O-rings, shrink hoses and elasto-plastic covers to protect them against salt water. Additionally all electrical components have been treated with a thin film of moisture-preventive coating. The entire electrical control system is also encapsulated and, as in an automobile, is positioned away from the engine in an appropriate part of the cockpit. Engine and control panels are connected with waterproof multi-socket harness.

Engine Monitoring and Control

A comprehensive range of sensors and meters monitors all operating functions. Instrumentation on cockpit dashboard includes rev. counter, water temperature, oil temperature, oil pressure, oil level, battery charging, and drive-belt tension. A separate warning system will automatically switch off fuel supply after a 10-second optical and acoustic signal when limits are exceeded.

WP 928 S/4



Power and Propelling

The Choice of the Optimal Application

Due to the different types of boats and boating areas various drive systems as stern drives, semi-submerged propellers, water jets, transmissions and couplings are undergoing most stringent testing procedures. Comprehensive results have already been achieved with the stern drive, the most common inboard/outboard system.

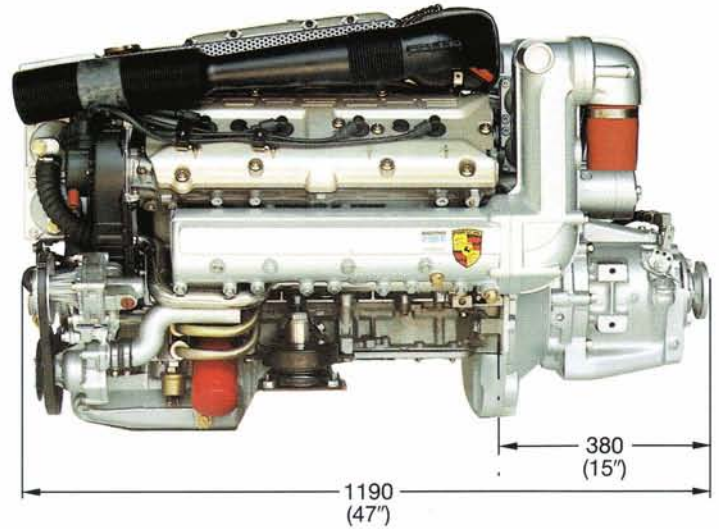
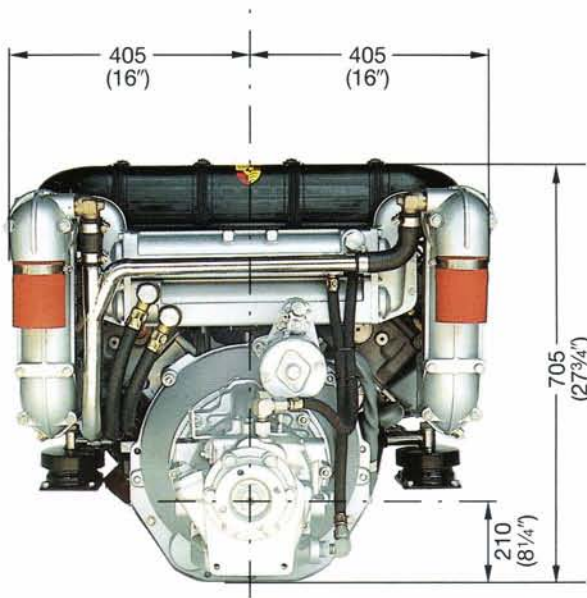


The Stern Drive

Common stern drives are not capable to take the tremendous torque and the top RPM of our engine. Therefore, a special version of the popular and reliable Stern Power has been developed in close cooperation with Marine Drive System, Edison, N. J. A lightweight transmission, outfitted with a hydraulic-operated clutch for soft shifting operation, is flanged to the engine to reduce RPM. Elastic mounts are fitted to a bellhousing consisting of lightweight aluminium alloy. The propulsion system is equipped with power trim/lift and external hydraulic steering for tighter and safer control at high speed. High propulsion efficiency and minimum cavitation effects are achieved by applying an extremely streamlined design of the submerged part.

Technical Data

WP 928 S/4 based on Porsche



Engine Data:

Petrol Engine 91ROZ (Octane unleaded)
 8 Zyl-V-Configuration
 Aluminium Block and Head
 Crankshaft with 5 Bearings
 4 Valve/Cylinder
 Double OHC-Camshaft
 Bosch Jetronic Injection System with Air Density metering
 Bosch EKZ Ignition System
 Knock Sensors with automatic advance device
 Double Resonance Air charging System
 Forced Feed Lubrication

Power acc. to DIN 6271 for Marine Engines

Conditions:
 Atmospheric pressure: 1000 mbar
 Ambient temp.: 27° C
 Rel. humidity: 60 %

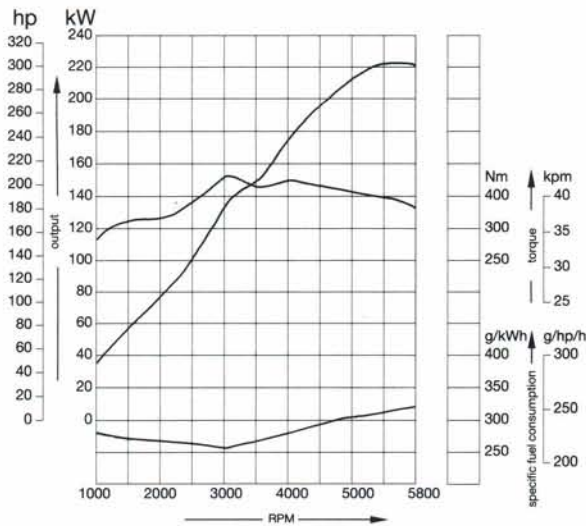
Yacht and Speedboats:

⊗ max. ISO net brake fuel stop power IFN

The power specifications and the specific fuel consumption data refer to premium unleaded gasoline of 91 octane or higher.

Our policy is one of continuous research and development, all illustrations, specifications and weights given here must not be taken as binding until confirmed by us.

Power curve



Standard equipment

- 1 Basic Engine see left
- 2 Water cooling System
Three circuit cooling by means of engine mounted 2 Freshwater, 1 Seawater pump, Heatexchangers for coolant and oil, Seawater Injectors for wet exhaust line
- 3 Double fuel feed pump with water separator and fuel filter
- 4 Bosch EKZ Ignition (maintenance free)
- 5 Bosch Jetronic-computerized Injection system
- 6 Bosch 14 V 55 Amp Alternator
- 7 Adjustable highly elastic Engine Mounts
- 8 Bellhousing with torsional Vibration Dampener
- 9 overcomplete Engine monitoring System with engine wiring with plug in System
- 10 Tool set spare parts Instruction and Maintenance manual, Service guideline, engine test report

Options

- Transmission with Stern Drive
- Transmission with Waterjet
- Transmission with Surface Propellers
- Transmission for inline power train (Standard Propeller)
- 928 Porsche Design Steering Wheel
- 928 Porsche Design Shifting Lever
- 928 Porsche Design Instrument Panel
- 928 Porsche Design Seats

WIZEMAN MARINE

J. WIZEMANN GMBH & CO.
 Geschäftsbereich Marine
 Neckarau 18
 D-7148 Remseck 3 (Hochberg)
 Tel.: 0 7146/4 02-0, Tlx.: 7 264 896
 WEST GERMANY